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COPE Program

Spring Advisory Council Meeting
May 12, 1987

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College of Forestry Oregon State University Corvallis, Oregon 97331-5704

April 20, 1987

MEMORANDUM

TO: COPE Advisory Council Members

FROM: Carl H. Stoltenberg, Dean
College of Forestry, OSU

Robert L. Ethington, Director
USFS, PNW Forest and Range Experiment Station

SUBJECT: COPE Advisory Council Meeting, May 12, 1987
Conference Room, Hatfield Marine Science Center, Newport, OR

Enclosed are background materials for our May 12, 1987 meeting at the Marine Science Center, Newport. The meeting will begin at 9:30 a.m. with coffee and rolls and an opportunity to visit with other Advisory Council members. The formal meeting will begin at 10:00 a.m.

The purposes of this meeting are:

1. Introduce Dr. Steve Hobbs, our new COPE coordinator (Tab D).
2. Review solicitation of funds for Adaptive COPE and recruitment efforts for staff.
3. Advise on the plans and programs for the FY 1988 Fundamental (Tab E) and Adaptive (Tab F) COPE.

Background materials for each task is enclosed. Short presentations will further clarify our proposals. Time is allotted for discussion and we look forward to receiving your advice.

We appreciate your continued service as a member of the COPE Advisory Council. We are especially grateful to those of your who have assisted us in our solicitation for research funds to support Adaptive COPE. We look forward to working with you to develop our FY 1988 program.

jlh
Enclosures

COPE PROGRAM
COPE Advisory Council Meeting

Conference Room
Hatfield Marine Science Center, Newport, OR
9:30 a.m., May 12, 1987

4/20/87

AGENDA
COPE ADVISORY COUNCIL MEETING

May 12, 1987
Conference Room
Hatfield Marine Science Center, Newport, OR

Time	Topic	Discussion Leader
9:30 a.m.	Coffee and Rolls	
10:00	Introductions, Minutes of November 25 Agenda Overview Introduction of Dr. Steve Hobbs	Bob Ethington
10:20	Solicitation for Adaptive COPE Funds	Carl Stoltenberg
10:45	Fundamental COPE, FY 1988	Don Boelter
11:15	Adaptive COPE, FY 1988	George Brown
11:30	Discussion	Council
11:50	Set Fall Meeting	Bob Ethington
12:00 Noon	Adjourn	

B

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236 Isthmus Heights Road
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Minutes
COPE Advisory Council Meeting
November 25, 1986
Hatfield Marine Science Center

Present: George Bengtson, Paul Benson, Bob Beschta, Mike Beyerle, Don Boelter, Jane Brass, George Brown, Stan Butzer, John Christie, Jerry Creasy, Bob Dale, Ray Doerner, Basil Edmunds, Bob Ethington, John Hampton, Bob Harris, Rob Jones, Ben McGill, Dan McKeel, Bob Metzger, Logan Norris, John Purcell, Jay Rasmussen, Jim Rombach, Rollie Rousseau, Harold Sawyer, Barte Starker, Carl Stoltenberg, Tom Thompson, Al Tocchini, Bill Vian.

Bob Ethington opened the meeting at 1000, called attention to the minutes of the May 15, 1986 meeting and described the objectives of the meeting today. These were:

- Reach consensus on the focus of COPE research.
- Provide advice on initial emphases for Fundamental COPE projects.
- Reach consensus on a plan for Adaptive COPE, including scope, schedule, budget and sources of support.

George Brown described the research planning efforts since the May 15 meeting. Three problem analysis workshops were held in June at Astoria, Newport and North Bend to receive input on management problem from coastal citizens and resource management specialists. Workshop summaries were published and distributed to Advisory Council members in July. A team of scientists then segregated the workshop data into research needs, education needs and socio-political issues. Research needs were synthesized into five integrated problem areas and presented to Carl Stoltenberg and Bob Ethington. They selected two for study, and scientists' teams then prepared a series of research prospectuses to define research objectives and costs.

Carl Stoltenberg explained the criteria he and Bob Ethington used to select the two problem areas for Fundamental COPE--Riparian Zone Management and Regenerating Coastal Forests. He then asked Advisory Council members to comment on selection of these two topics for Fundamental COPE. A summary of committee members' comments is as follows:

John Hampton: Satisfied that we got a good cross section of input from coastal citizens and resource managers.

Mike Beyerle: State Forestry staff supported the priorities identified in the workshops and the two topics selected.

Bob Harris: Need to know what can be produced on specific sites.

Bob Dale: Riparian zone management and reforestation are the top two priorities.

Tom Thompson: Agreed with the priorities, but concerned about the size of the wildlife research proposals.

Jerry Creasy: How to stem the loss of productive timber land from the harvest base?

Ray Doerner: Long-range productivity isn't the immediate problem; it's how to fill the gap in the next 30 years. Agreed that riparian zone management is the most important issue on public land.

Barte Starker: Regenerating coastal forests and riparian zone management as described in the material sent encompasses most of the important issues of productivity and management of coastal forests.

John Purcell: We need to focus on multiple use research to get to a compatible win-win situation in resource management.

Rollie Rousseau: Choices are right on the mark. Research on riparian zones will help with decisions down the road, even though decisions today must use information presently available.

Bob Metzger: Key issues are soil stability for long-range productivity and water quality maintenance. BLM will need results from COPE for 1990-91 plans.

Bob Ethington then described the budget outlook for FY 1987 and asked George Brown and Don Boelter to describe the Fundamental Research projects proposed for initiation this fiscal year. Following their presentations he asked Council members to identify the most important issues for immediate attention. Their comments follow:

John Hampton: Focus on those issues that get the most leverage. Postpone research on site productivity and focus on the riparian zone management issue. What will help resolve the timber-fish-wildlife conflicts?

Bob Dale: Highest priority is the headwalls project and the aquatic resources inventory. Red alder project is not as important. In regeneration, zero in on alternatives to burning and animal damage control. Favors a research design that will get useful data in first two years to help BLM in their present planning cycle.

Barte Starker: Need to examine benefits of fire as well as negative impacts. Examine the full range of alternatives that would apply to both public and private lands.

Ray Doerner: Agrees with Barte Starker, including the issue of herbicides. Research projects on headwalls, inventory of riparian zones and aquatic habitat are all high priority. In regeneration research, focus on competition control.

Jay Rasmussen: Unsure that the economics study includes more than just timber.

Rollie Rousseau: Focus habitat enhancement research on techniques.

John Purcell: The objective of wildlife studies should be to give managers information on options.

Jerry Creasy: Focus on research that helps resolve the riparian zone set-aside issue. We need to examine the impacts of slash burning on firewood removal.

Bob Dale: Examine alternatives to burning, how to get regeneration without it.

Barte Starker: In studies of fire impacts, need to include benefits and inter-relation of slash to animals, the impact of slash as a function of moisture content, species and fire hazard.

Bob Metzger: Studies may emphasize fire too much given the likelihood of more stringent control.

Bob Ethington summarized the discussion noting that the Council, in general, recommended focusing on short-term payoff in the first formative years of COPE. He invited members to provide additional comments in writing at a later time.

Carl Stoltenberg presented the proposal for the Adaptive Research and Education program. He described the staffing plan, general activities for the first three years and budget. He asked George Brown and Logan Norris to give examples of possible projects, now that the Council had agreed on Fundamental COPE thrusts. Carl then asked for Council comment.

Jerry Creasy: May wish to add an economist to the team.

Ray Doerner: Important to station the Adaptive team in Newport.

Tom Thompson: May be better able to send people to Adaptive COPE than dollars.

John Hampton: Siuslaw National Forest is an important partner; signals interest to the public in finding solutions to conflicts.

John Christie: Encourage you to consider including STEP people in the Adaptive effort; also Washington DNR expertise on stream enhancement.

Basil Edmunds: Sea Grant may be a possibility for additional funds, especially economics work.

Ray Doerner: Don't use loaned personnel; picking the right people is critical.

Bob Dale: Recommend a team in Newport; at least four, hopefully five, by 1989. Supports a shared budget with 20% from BLM. Local sharing will be essential.

Mike Beyerle: Supports Newport as the Adaptive team headquarters location. Do not use loaned people as team members. Suggest you tap other state agencies like DLCD and DEQ.

John Purcell: Recommend conservation groups be included.

Bill Vian: A $50,000 level for county participation is reasonable, but we need a plan for involving each of the thirteen COPE-area counties.

Jay Rasmussen: Add National Marine Fisheries Service, Fish and Wildlife Service, Oregon Department of Water Resources and Soil Conservation Service to the list of contributing agencies, perhaps on 2-4 year basis. Increase budget contriubtion for "Other" from 5% to 10%.

Jane Brass: National Coastal Research and Development Institute could possibly fund some pieces (such as education programs) after COPE gets going.

Stan Butzer: Adaptive COPE is critical; may wish to consider moving Fundamental COPE funds to Adaptive early in the program. BLM is heavily committed to FIR; would propose BLM's contribution be at less than full share initially and larger later because of FIR commitment until 1990.

Barte Staker: A $150,000 per year range is reasonable for industry.

John Purcell: Size and scope are on target; Budget Alternative #2 (copy attached) for cost sharing is more reasonable; agrees with need to include more agencies in the "Other" category.

Bill Vian: Can southwest Oregon counties now contributing to FIR move their funds to COPE or must they contribute to both?

Rollie Rousseau: Size and scope are on target; state agencies may wish to get a collective appropriation routed through a "lead agency" such as State Forestry.

Mike Beyerle: State Forestry contributions will come out of "state lands" budget, not General Fund appropriation.

John Hampton: Will help solicit funds from industry; is not optimistic about getting a full industry share.

Ray Doerner: COPE will be more difficult to fund than FIR. Need to show results soon.

Bob Metzger: COPE will have immediate payoff but not like FIR. Simply doing the research will help people understand that we are seeking answers.

Jay Rasmussen: If you can show that research will lead to a resolution of issues on forest land base, it will be a major selling point.

Carl Stoltenberg summarized the discussion as follows:

- Adaptive COPE should start in 1987 in Newport.
- Staffing should increase to five specialists eventually.
- We anticipate some difficulties with funding in the early years.
- Budget Alternative #2 is the most appropriate for sharing costs; seek to increase the share for "Other" agencies to 10%.

Carl Stoltenberg adjourned the meeting at 1500.

Respectfully,

George Brown
Recorder

jlh

3

RESUME

STEPHEN D. HOBBS

PERSONAL DATA

Birthdate: September 4, 1946
Address: 2637 Snowcrest Drive, Medford, OR 97504
Home phone: (503) 779-9232 Office phone: (503) 776-7116
Marital status: Married with two children

EDUCATIONAL BACKGROUND

B.S. Forest Management - University of New Hampshire, 1969
Ph.D. Forestry Science - University of Idaho, 1977

MILITARY SERVICE

1969 - 1973; held various command and staff positions; served in the United States, Panama, and South Vietnam; attained the rank of Captain, Regular Army.

PROFESSIONAL EXPERIENCE

Coordinator of the Adaptive FIR (Forestry Intensified Research) Program and Associate Professor in the Department of Forest Science, College of Forestry, Oregon State University.
1978 to present

Assistant Professor and Extension Forestry Specialist in the Department of Forestry, University of Arkansas at Monticello.
1977 to 1978

CURRENT POSITION

Coordinator of the Adaptive FIR (Forestry Intensified Research) Program and Associate Professor in the Department of Forest Science, College of Forestry, Oregon State University.
1978 to present

Responsibilities:

* Coordinate the research and extension activities of the Adaptive FIR staff in Medford.

* Prepare and manage an annual program plan that incorporates individual staff member plans and insures completion of contractual obligations and long-term program goals.

- Prepare an annual program budget and manage the expenditure of funds.

- In cooperation with the USDA Forest Service and USDI Bureau of Land Management formulate annual contract deliverables for the Adaptive FIR Program.

- Provide liaison with 23 cooperating organizations, the general public, press, and other forest research organizations.

- Supervise the synthesis of group reports, handle routine administrative matters, and make duty assignments as necessary.

- Represent the FIR Program and Oregon State University before various organizations and public hearings as necessary.

- Conduct reforestation-related research in southwest Oregon.

- Conduct a continuing education/extension program in reforestation for southwest Oregon.

Research Projects:

The following pertains to individual research projects that focus on reforestation-related problems in southwest Oregon.

- Five completed projects (Principal Investigator)
- Two ongoing projects (Principal Investigator)
- Four ongoing projects (Co-principal Investigator)

Publications: 35

Invited Papers: 19

Voluntary Papers: 5

Continuing education/extension:

- Directed or Co-directed 13 workshops.

- Editor of the FIR Report in 1979.

- Contributed 48 articles to the FIR Report.

- Conducted 85 field trips to FIR research sites for cooperators and the public.

- Have given numerous presentations on the FIR Program, research, and technology transfer to a wide variety of organizations over the last nine years.

* Senior Editor of the book Reforestation Practices in Southwest Oregon and Northern California which is in preparation.

PROFESSIONAL RECOGNITION

1986 Alumni Achievement Award, College of Forestry, Wildlife and Range Sciences, University of Idaho

PROFESSIONAL SERVICE

Member - Southern Forestry Hardwood Group. 1978.

Member - Reforestation Committee, Western Forestry and Conservation Association. 1979.

Vice Chairman - Siskiyou Chapter, Society of American Foresters. 1979-1980.

Chairman - Siskiyou Chapter, Society of American Foresters. 1980-1981.

Secretary - Reforestation Committee, Western Forestry and Conservation Association. 1982.

Vice Chairman - Reforestation Committee, Western Forestry and Conservation Association. 1983.

Chairman - Reforestation Committee, Western Forestry and Conservation Association. 1984.

Member - Editorial Board, New Forests, Martinus Nijhoff Publisher. 1985-present.

Member - Timber Advisory Board to the Josephine County Board of Commissioners. 1979-1981.

Member - Forest Science Committee, Oregon Society of American Foresters. 1982-present.

Member - Vegetation Management Committee, Oregon Society of American Foresters. 1986-present.

Chairman - Vegetation Management Committee, Oregon Society of American Foresters. 1986.

Coordinator - Science and Technology, Oregon Society of American Foresters. 1987.

Member - American Society of Agronomy
Ecological Society of America
Society of American Foresters
Soil Science Society of America
Western Forestry and Conservation Association

UNIVERSITY COMMITTEES

Member - Academic Appeals Committee, University of Arkansas. 1977-1978.

Member - Extension Committee, Department of Forest Science. 1980-1983.

Member - Management Committee, Department of Forest Science. 1982-present.

Member - Research Committee, Department of Forest Science. 1984-present.

Member - Promotion and Tenure Committee, Department of Forest Science. 1984-present.

E

SUMMARY
FUNDAMENTAL COPE
Research Projects
FY 1988

Continuing Projects

A. Riparian Zone Management

1. Evaluating the Socio-Economic Ramifications of Alternative Forest Resource Management Options in Coastal Oregon (Brian Greber, OSU; Con Schallau, PNW)

2. Inventory of Riparian Vegetation (David Paine and John Tappeiner, OSU; Tom Spies and Jim Sedell, PNW)

3. Fish Habitat and Riparian Zone Interactions: A Basin Perspective (Bob Beschta and Stan Gregory, OSU; Gordy Reeves and Fred Everest, PNW)

4. Headwalls--Landslide-Prone Areas: Stability Evaluation, Effectiveness of Leave Areas, Effects of Slides on Riparian and Fisheries Resources (Hank Froehlich, OSU; Fred Swanson, Fred Everest and Jim Sedell, PNW; Byron Thomas, BLM; Keith Mills, ODF)

5. Cost of Producing Additional Non-Timber Outputs From Riparian Zones (Doug Brodie, OSU)

B. Regenerating Coastal Forests

1. Analysis of Prescribed Burning in the Oregon Coast Range (Jack Walstad and Steve Radosevich, OSU)

2. The Effect of Slash Burning of the Number and Distribution of Planting Spots and Planting Productivity on Sites in the Oregon Coast Range (John Zasada and and Bill Stein, PNW)

3. Ecology and Management of Shrubs and Hardwoods in Coastal Forests (John Tappeiner and Steve Radosevich, OSU; John Zasada, PNW)

4. Trial of Methods Including Fire to Control Competing Vegetation (Dave Sandberg and Roger Ottmar, PNW)

5. Reducing Air Pollution From Hardwood Conversion Burning in Coastal Oregon (Dave Sandberg and Roger Ottmar, PNW)

New Projects

A. Riparian Zone Management

1. Wildlife Density and Diversity in Riparian Zones (Bill McComb, Dave deCalesta, Chuck Meslow and Bob Anthony, OSU)

B. Regenerating Coastal Forests

1. A Diagnostic Tool for Predicting the Effects of Interspecific Competition on Growth and Yield of Douglas-Fir (Steve Radosevich and Mike Newton, OSU)
2. Environment and the Natural Regeneration of Conifers (Don Minore, PNW)

Fundamental COPE
Work Plan

1. Title:

Evaluating the Socio-Economic Ramifications of Alternative Forest Resource Management Options in Coastal Oregon.

2. Principal Investigator(s) and Organization(s):

Dr. Brian Greber, Assistant Professor, Forest Management Department, College of Forestry, OSU, Corvallis
Dr. Con Schallau, Project Leader, Pacific Northwest Research Station, Corvallis

3. Study Objective(s):

a. To enable the translation of alternative levels of resource outputs into community impacts by permitting the assessment of the implied changes in employment, income, occupational makeup, demographic characteristics, and county revenues and expenditures.

b. To integrate the results of this study with the results of other COPE research, in order to fully assess the implications of management options proposed for Coastal Oregon.

4. Potential Benefit or Utility of the Study:

The economy of Coastal Oregon is greatly dependent on the fisheries, recreation, and forestry industries. In that all of these industries, as well as the general quality of life in Coastal Oregon are influenced by decisions related to the management of the forest, it is important that we be able to translate forest management options into impacts upon Coastal communities. The improved assessment of nonfinancial benefits and costs will aid in the analysis of managerial options as well as political options (e.g., tax policy, social infra-structures needs, and forest practices regulation).

A comprehensive economic assessment will be made of the Oregon Coast, including the development of an integrated model of the regional economy, with case specific analyses of management options proposed within the course of other COPE research. Such a model and the related assessments are crucial if we wish to go beyond the standard assessment of financial merit of management options. By blending the econometric, input-output, and simulation techniques with which the investigators have extensive knowledge, a model can be developed that can translate proposed alternatives into employment, income, occupational and demographic makeup, and county revenues.

5. Research Activities:

   a. Accomplishments to date in FY 87:

   Input-output models for Western Oregon completed. Necessary data collected for econometric model.

   b. Tasks yet to be completed in FY 87:

   Prepare final draft of study plan. Complete input-output model of western Oregon and estimate econometric models of direct and indirect employment, and workforce impacts.

   c. Plans for FY 88:

   Subdivide the input-output analysis and merge the econometric models and the input-output models into the comprehensive, empirical model of the Coastal Oregon economy.

6. Publication and Technology Transfer Activities:

   a. Completed to date in FY 87:

   None

   b. Planned for remainder of FY 87:

   Generate an office report detailing the Coastal economy, and presenting the results of the input-output and econometric modeling efforts. Prepare technical journal article on econometric models.

   c. Planned for FY 88:

   Prepare FRL or PNW paper discussing the Coastal economy and referencing the modeling efforts

7. Estimated Cost:

	OSU	PNW
FY 87	26,500	10,000
FY 88	29,000	15,000
FY 89	30,000	10,000
FY 90	20,000	5,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 91

COPE

Study Prospectus

1. Title:

   Inventory of Riparian Vegetation

2. Principal Investigators and Organizations.

   David Paine (OSU-Forest Management), John Tappeiner (OSU-Forest Management), David Perry (OSU-Forest Science), Tom Spies (PNW-Plant Ecology), Charles Bolsinger (PNW-Forest Inventory), and Jim Sedell (PNW-Fisheries).

3. Applicable COPE Problem:

   Managing Riparian Zones

4. Study Objective:

   a. Using photogrammetric and other remote sensing techniques, conduct an extensive inventory of representative drainage basins within the Coast Range for broad species composition and age class of riparian vegetation.

   b. Determine the existing riparian vegetation structure (mosaic) within representative drainage basins according to stream size, valley width and gradient.

   c. Determine what vegetation will regenerate in a given geomorphic zone along a stream or river.

   d. Determine stand dynamics of streamside vegetation among different streamside forests and between different stands along a stream size gradient within a basin.

   e. Develop guidelines and techniques for managing the major shrub, hardwood, and conifer species of coastal Oregon. (Note: This part of the project will be coordinated with the proposed ecology and management of shrubs project.)

5. Justification

   Currently, the vegetative species composition structure and stocking and density are unknown for coastal Oregon riparian zones. Proposed changes in Forest Practice Rules have generated several economic effects models with very little quantitative knowledge of the streamside forest composition of shrubs, hardwood, and conifers. Most of the hypothesized inputs of these models are highly sensitive to stocking densities along small streams and large streams and rivers. The limited data available suggests that streamside forests and riparian zones are understocked in conifers and well stocked in hardwoods and shrubs. Fisheries and Wildlife concerns with streamside forests are currently focused on a perceived lack of large conifers along streams and rivers. If stream side buffers are left with for conifers these nontimber resources goals may not be met.

A riparian vegetation inventory is fundamental and essential to any study of riparian zones in coastal Oregon. Quick results are necessary in order to select research sites for both extensive and intensive basin and stand level studies. The survey will also be necessary for any economic modeling effects. The ecology and management of streamside vegetation is an important element of this study and can be done, in part, in conjunction with the reforestation proposal of Tappeiner, Zasada, and Rasodevich.

The riparian vegetation along a stream varies with size of stream, gradient of stream and valley width. If streamside leave areas are being managed differently than the adjacent upslope vegetation, concerns have been raised as to whether both timber and fisheries and wildlife objectives for vegetation can be met in the long term as well as the short term. These studies are designed to address these concerns.

6. Anticipated Initiation and Completion Dates:

Initiation--FY 1987
Completion--FY 1990 (June 30) overall photogrammetric inventory and basin mosaics
--FY 1993 ecology of riparian zones

7. Proposed tasks to be completed by Fiscal Year:

Forest Year, FY-1987

a. Coordinate with other COPE projects and relevant organizations (state, private, federal)

b. Select drainage basins to be mapped and inventoried.

c. Develop a riparian vegetative inventory and mapping system compatible with an appropriate data base and GIS system (probably MOSS) useable by other COPE research teams. In addition to cover type mapping, the GIS system should produce overlays of slope, aspect, stream gradient, etc.

d. Secure appropriate photography and begin mapping one major river basin (probably the Elk River.)

Second Year, FY-1988

a. Complete first river basin inventory (with limited ground truth) and accompanying tabular data.

b. Select next drainage basin to be analyzed and obtain suitable photography.

c. Based on experience gained to date and in consultation with other research temas make recommendations for desirable changes in the system for inventorying the next river basin to be inventoried.

Next 3-7 Years

Develop predictive methodologies and models for riparian zone management.

Continue monitoring experimental treatment plots.

8. Publication and Technology Transfer Plans by Fiscal Year:

Initial results could be used for economic modeling and short courses, extension notes, field trips by late 1988. As inventory is completed, formal publications will be prepared. Experimental studies and stand dynamics studies could be part of workshops and field trips in 1988-89 but results would not be available until 1990-91.

9. Estimated Cost by Fiscal Year:

	OSU	PNW	Total
FY 1987	$51,000	$15,000	$66,000
FY 1988	60,000		

Fundamental COPE
Work Plan

1. Title:

Fish Habitat and Riparian Zone Interactions: A Basin Perspective.

2. Principal Investigator(s) and Organization(s):

Dr. Robert Beschta, Associate Professor, Forest Engineering Department, College of Forestry, OSU, Corvallis
Dr. Fred Everest, Project Leader, Pacific Northwest Research Station, Corvallis
Dr. Stanley Gregory, Associate Professor, Department of Fish and Wildlife, College of Agricultural Sciences, OSU, Corvallis
Dr. David McIntire, Department of Botany, College of Science, OSU, Corvallis
Dr. Gordon Reeves, Research Fish Biologist, Pacific Northwest Research Station, Corvallis
Dr. Frederick Swanson, Geologist, Pacific Northwest Research Station, Corvallis

3. Study Objective(s):

To describe relationships between riparian zones and critical fish habitat, and to provide a foundation for basin-wide management of riparian resources and fisheries.

4. Potential Benefit or Utility of the Study:

A variety of social, political, and environmental factors are forcing rapid change in management of fish habitat through the management of riparian zones, large woody debris, and instream structures. These management activities are seldom considered in a basin-wide context, a perspective that is essential for successful management of these resources, particularly where mixed ownership patterns prevail.

Results of this study will provide a basis for planning/designing/implementing management of riparian and fish habitat from the standpoints of timber harvest, landslide/debris flow mitigation, woody debris management, and habitat enhancement projects. Criteria will be developed for identifying critical areas of fish habitat.

5. Research Activities:

a. Accomplishments to date in FY 87:

None

b. Tasks yet to be completed in FY 87:

1) Develop conceptual (hierarchial) framework for basin analysis based on concepts developed from past riparian and ecosystems research.

2) Prepare study plan. Coordinate with other COPE projects and relevant organizations (state, private, and federal).

3) Select three basins (north, central, and south coast regions) as representative study sites based on:

4) Develop and initiate sampling program to characterize landform, vegetation, fish, channel characteristics, history of disturbance by natural and management activities in the selected basins.

c. Planned for FY 88:

1) Continue with task 4 in FY 1987 plan of work.

2) Identify patterns of natural and management-related disturbances in the selected basins (establish trends and incorporate information onto a geographical information system). Aerial photo analysis will be a significant component of this work.

3) Initiate data analysis.

6. Publication and Technology Transfer Activities:

a. Completed to date in FY 87:

None

b. Planned for remainder of FY 87:

Initial results will be incorporated into existing technology transfer activities (eg., extension notes and newsletters, short courses and workshops, field trips, etc.).

c. Planned for FY 88:

As studies are completed, formal publications will be prepared for technical journals.

7. Estimated Cost:

	OSU	PNW
FY 87	35,000	45,000
FY 88	65,000	45,000
FY 89	To be determined for subsequent years after completion of a study plan.	

8. Duration of the Study:

Initiation date: FY 87
Scheduled completion date: To be determined after completion of a study plan.

Fundamental COPE
Work Plan

1. Title:

Headwalls--Landslide-Prone Areas: Stability Evaluation, Effectiveness of Leave Areas, Effects of Slides on Riparian and Fisheries Resources.

2. Principal Investigator(s) and Organization(s):

Dr. Frederick Swanson, Geologist, Pacific Northwest Research Station, Corvallis
Dr. Henry Froehlich, Professor, Forest Engineering Department, College of Forestry, OSU, Corvallis
Dr. Bryan Thomas, Soil Scientist, Bureau of Land Management, Portland
Dr. Kieth Mills, Geotechnical Specialist, Oregon Department of Forestry, Salem
Dr. Fred Everest, Project Leader, Pacific Northwest Research Station, Corvallis
Dr. James Sedell, Ecologist, Pacific Northwest Research Station, Corvallis

3. Study Objective(s):

a. Compare and evaluate existing approaches to judging the stability of headwalls (landslide-prone areas).

b. Develop an improved method of stability evaluation appropriate for field use, if available techniques prove to be inadequate.

c. Evaluate the effectiveness of headwall vegetation leave areas in mitigating occurrence of clearcut-caused increases in landslide frequency.

d. Evaluate the effect of landslides and resulting debris flows on riparian and fish habitat.

e. Delineate zones of various levels of landslide susceptibility in Western Oregon.

4. Potential Benefit or Utility of the Study:

Evaluation of slope stability in marginally stable areas forms the basis for management decision on Federal, State, and private land. This research will result in the development of an effective and efficient system for evaluation of the potential for sliding after clearcutting.

5. Research Activities:

a. Accomplishments to date in FY 87:

None

b. Tasks yet to be completed in FY 87:

1) Prepare study plan. Coordinate with other COPE projects and relevant organizations.

2) Compare headway stability evaluation systems.

3) Compile history and stability evaluations for all headwall leave areas in all areas of the Coast.

c. Planned for FY 88:

1) If a significant storm has occurred, revisit headwall study sites. Sample slides in headwall leave areas, associated clearcut headwalls, and nearby forested control headwalls to assess the effectiveness of headwall leave areas in controlling in-unit sliding.

2) Compile the histories of landslides and debris flows using aerial photographic records. Estimate extent of channel system affected by debris flows. Develop models to predict runout.

3) Compare fish habitat characteristics of basins which have been highly impacted by debris torrents and basins lightly impacted.

6. Publication and Technology Transfer Activities:

a. Completed to date in FY 87:

None

b. Planned for remainder of FY 87:

Results will be incorporated into existing technology transfer activities (e.g., extension workshops and newsletters, short courses, field tours, etc.)

c. Planned for FY 88:

Publication in technical journals, especially Western Journal of Applied Forestry.

7. Estimated Cost:

	OSU	PNW
FY 87	25,500	62,000
FY 88	50,000	100,000
FY 89	To be determined for subsequent years after completion of a study plan.	

8. Duration of the Study:

Initiation date: FY 87
Scheduled completion date: To be determined after completion of a study plan.

Fundamental COPE
Work Plan

1. Title:

Cost of Producing Additional Non-Timber Outputs from Riparian Zones.

2. Principal Investigator(s) and Organization(s):

Dr. J. Douglas Brodie, Professor, Forest Management Department, College of Forestry, OSU, Corvallis

3. Study Objective(s):

a. Determine least cost way to increase the production of various non-timber outputs from a range of riparian sites and management options.

b. Compare multiple use policies applied to sites to see if the implied values of non-timber outputs vary widely from site to site.

4. Potential Benefit or Utility of the Study:

Understanding the costs of producing non-timber outputs on a range of sites tells the manager how to increase the non-timber output at no additional cost, through reallocation of the production to lower cost sites. This cost includes both the direct management cost of producing the non-timber output and the opportunity cost of timber values foregone. The costs that managers are willing to incur to produce non-timber outputs should be reasonably stable across sites. If they are not it means that the same level of non-timber output can be produced at lower cost by reallocating the production to lower cost sites. This information can help reduce multiple use conflicts by providing the means to achieve higher levels of non-timber outputs with existing resources or to achieve levels of non-timber outputs without excessive costs in foregone timber production.

5. Research Activities:

a. Accomplishments to date in FY 87:

None

b. Tasks yet to be completed in FY 87:

Complete review of literature, problem analysis, and study plan.

c. Planned for FY 88:

Complete data collection and analysis of case study of selected non-timber outputs on selected sites.

6. Publication and Technology Transfer Activity:

a. Completed to date in FY 87:

None

b. Planned for remainder of FY 87:

None

c. Planned for FY 88:

Report describing the theory of imputed values and application to multiple use forest management.

7. Estimated Cost:

	OSU
FY 87	11,000
FY 88	25,000
FY 89	To be determined for subsequent years after completion of a study plan.

8. Duration of the Study:

Initiation date: FY 87
Scheduled completion date: To be determined after completion of a study plan.

Fundamental COPE
Work Plan

1. Title:

Prescribed Fire in Pacific Northwest Forests: An Analysis.

2. Principal Investigator(s) and Organization(s):

Dr. John D. Walstad, Professor, Department of Forest Science, College of Forestry, OSU, Corvallis
Dr. Steven Radosevich, Professor, Department of Forest Science, College of Forestry, OSU, Corvallis
Dr. David Sandberg, Project Leader, Pacific Northwest Research Station, Seattle

3. Study Objective(s):

a. Summarize what is known about fire and prescribed burning in Pacific Northwest forests.

b. Interpret what it means from the standpoint of:

1) Significance of available information

2) Degree of scientific uncertainty and data gaps

3) Relavancy to current issues

c. Provide recommendations for decision makers to consider in formulating policies and actions concerning prescribed burning.

4. Potential Benefit or Utility of the Study:

Prescribed burning is a multi-purpose silvicultural practice used throughout the Pacific Northwest. Its importance notwithstanding, this practice is increasingly threatened by regulatory constraints, weather conditions, and health and environmental concerns. The future viability of prescribed burning is predicated upon judicious use of this important forestry practice. An objective analysis of the scientific literature and operational experience concerning prescribed burning would be helpful to decisionmakers faced with silvicultural, regulatory, and legislative issues surrounding this practice. It will be prepared by a team of well-qualified specialists in the Pacific Northwest.

5. Research Activities:

a. Accomplishments to date in FY 87:

None

b. Tasks yet to be completed in FY 87:

Identify and designate team members; organize the project; prepare project plan; and prepare topic outlines.

c. Planned for FY 88:

Draft of individual sections prepared; team review and peer review completed.

6. Publication and Technology Transfer Activities:

a. Completed to date in FY 87:

None

b. Planned for remainder of FY 87:

None

c. Planned for FY 88:

Consolidated report prepared and edited for publication; publication and distribution of the report.

7. Estimated Cost:

	OSU	PNW
FY 87	27,000	5,000
FY 88	34,000	5,000
FY 89	20,000	3,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 89

Fundamental COPE
Work Plan

1. Title:

The Effects of Slash Burning on the Number and Distribution of Planting Spots and Planting Productivity on Sites in the Oregon Coast Ranges.

2. Principal Investigator(s) and Organization(s):

Dr. John Zasada, Research Forester, Pacific Northwest Research Station, Corvallis
Dr. John Tappeiner, Professor, Forest Management Department, College of Forestry, OSU, Corvallis
Dr. William Stein, Research Forester, Pacific Northwest Research Station, Corvallis

There will also be two advisors for the project. One will be a BLM representative and the other from forest industry. They will be knowledgeable with regard to planting on Coast Range sites and will assist in developing the study methodology and site selection.

3. Study Objective(s):

a. Provide foresters with a method to quantitatively assess the relationship between fuel loading and planting productivity.

b. Determine the relationship between fuel loading and the density and distribution of planting spots.

4. Potential Benefit or Utility of the Study:

One key objective in burning slash is to increase the number of planting spots, improve the accessibility to the site and increase planting efficiency. Because of weather constraints, air quality concerns, increased cost of burning, and the potential for increased soil erosion and nutrient loss following fire, it is not possible to burn all of the cutovers that would be burned for this specific purpose. A quantitative method is needed to prioritize cutovers for burning based on the relationship between fuel loading, planting spots needed, and planting efficiency.

5. Research Activities:

a. Accomplishments to date in FY 87:

None

b. Tasks yet to be completed in FY 87:

Prepare study plan. Select 20-25 study sites that are scheduled for slash burning in 1987 or 1988. Survey sites after harvesting and prior to burning.

c. Planned for FY 88:

Complete post burning surveys and survey additional sites if necessary. Analyze data and prepare project report for publication.

6. Publication and Technology Transfer Activities:

a. Completed to date in FY 87:

None

b. Planned for remainder of FY 87:

None

c. Planned for FY 88:

Results will be published in 1988 or 1989 after the study is completed. Presentation will be made at workshops to inform forest managers and other interested groups of study results.

7. Estimated Cost:

	OSU	PNW
FY 87		35,000
FY 88	4,000	45,000
FY 89	5,000	20,000

8. Duration of the Study:

Initiation date: FY 87
Scheduled completion date: FY 89

COPE

Study Prospectus

1. Title:

Ecology and management of shrubs and hardwoods in coastal forests.

2. Principle Investigators:

John Tappeiner, OSU; John Zasada, PNE; and Steve Radosevich, OSU (this work will be coordinated with other work proposed for Riparian Zones-it will be done on the same sites--; the effect of burning work proposed here will be conducted in cooperation with Dave Sandberg, PNW).

3. Applicable COPE Program:

Reforestation of Coastal Forests; Management of Riparian Z ones.

4. Study Objectives:

Develop guidelines and techniques for managing the major shrub and hardwood species in the forests of coastal Oregon by:

a. relating their potential rates of vegetative reproduction to the size and vigor of their aerial and/or underground parts;

b. determining the effect of common silvicultural treatments (logging, burning, cutting) on these parts;

c. determining their rates of reproduction and growth from seed and sprouts in a range of environments common in clearcuts and in young and old-growth stands.

5. Justification:

Currently, foresters manage coniferous vegetation in the Coast Ranges to enhance conifer growth and to provide wildlife habitat. However, they do so with little information ont he reproduction and growth of shrubs and hardwoods. At what stage of succession do shrubs and hardwoods become established? What environments favor their establishment, and what are their growth rates following reproduction from seed, from vegetative reproduction, and following burning and other silvicultural treatments? How can establishment and growth be predicted? At what age and in what environments do they produce seed? How does interspecific competition affect succession and species composition? With answers to these questions, foresters will be better able to make site-specific prescriptions to produce wildlife habitat and to enhance conifer growth. Zasada and Tappeiner have begun seedling growth and survival studies on salal, bigleaf maple, vine maple, thimbleberry, and elderberry. Tappeiner has completed studies on vegetative and seedling reproduction of tanoak and madrone. Radosevich has begun studies on the seeding establishment and vegetative growth of thimbleberry and salmonberry. Thus collectively, with this proposed research, we will be able to make a substantial step toward answering the questions posed for these major species.

6. Anticipated Initiation and Completion Date:

January 1, 1987 to January 1, 1993.

7. Tasks to be Completed by Fiscal Year:

FY 1987

A. Write study plan.

B. Select three to five sites which are scheduled to be clear within three to six months. Measure above and below parameters of shrubs and establish plots for remeasurement following logging and site preparation.

C. Establish seed reproduction study plots and being seed collection and testing 3 - 4 sites.

D. Begin excavation and above and below ground measurement of salmonberry and salal communities to determine the structure of these communities and potential stability. Establish cutting and long-term measurement plots -- 4 - 5 sites.

E. Measure buds, shoots and biomass production of planted and natural salmonberry and thimbleberry. Follow germination and seedling survival. Begin salmonberry-thimbleberry reproduction model.

FY 1988

A. Select 4 - 8 sites to be clearcut and establish shrub/hardwood response plots. Remeasure plots established in 1987.

B. Sow seed reproduction study, follow germination and survival. Establish second year replication.

C. Continue excavation of salmonberry and salal on riparian and upland sites. 4 - 5 sites.

D. Final measurement of buds, shoots, and biomass, of salmonberry and thimbleberry communities. Observe seeding survival. complete salmonberry-thimbleberry reproduction model.

8. Publication and Technology Transfer:

Technology transfer could beging by 1988 or 1989 by participation in workshops. Publication of initial work could beging by 1989.

9. Estimated Cost by Fiscal Year:

1987	$29,000 for site location and initial establishment
1988 to 1991	$45,000 - $55,000 for major installations and monitoring.
1992 to 1993	$30,000 per year for final shrub community analysis and measurement, data analysis, and publication.

Fundamental COPE
Work Plan

1. Title:

Characterization of the Thermal Environment for Developing Guidelines to Manage Shrubs and Hardwoods in Coastal Forests.

2. Principal Investigator(s) and Organization(s):

Dr. David Sandberg, Project Leader, Pacific Northwest Research Station, Seattle
Dr. Roger Ottmar, Research Forester, Pacific Northwest Research Station, Seattle

The research will be conducted jointly with John Tappeiner, OSU; John Zasada, PNW; and Steve Radosevich, OSU (Ecology and Management of Shrubs and Hardwoods in Coastal Forests) to describe and model the thermal environment of prescribed fires for assessing the response of several herbaceous and woody species to fire.

3. Study Objective(s):

a. Characterize the humus layer and soil thermal environment (depth of heat penetration, intensity, and duration) from broadcast burns in coastal forests.

b. Develop a thermodynamic heat transfer model based on the relationship between woody fuel load, humus load, live vegetation load, lighting method, fuel moisture, soil moisture, and soil heat transfer properties.

4. Potential Benefit or Utility of the Study:

One of the benefits from prescribed fire is the short-term control of certain plant species which will improve the establishment and survival of tree seedlings. Through the heating of the humus and soil layers by the fire, the roots, rhizomes, and buried seeds of unwanted weed species are affected. However, most vegetation succession studies have described the vegetation response without documentation of the fire and the humus and soil thermal environment which created the response.

This study will provide the thermal environment characterization and modeling that is a critical element in development of guidelines for managing the major shrub and hardwood species in the forests of coastal Oregon, the chief objective of the companion study.

The heat intensity, duration, and penetration into the humus and soil layer generated by broadcast burning logging debris is the critical variable determining the overall effectiveness of fire for controlling undesirable vegetation. Modeling the heat transfer process using variables which managers can easily acquire will allow preharvest and prescribed fire planning to best control vegetation and mitigate the effect of fire on air, soil, and water resources.

5. Research Activities:

a. Accomplishments to date in FY 87:

Initiated contact with Pacific Forestry Centre, British Columbia for demonstration and acquisition of 10-20 thermologgers for measuring humus and soil temperature profiles.

b. Tasks yet to be completed in FY 87:

Prepare study plan. Begin modification of thermologgers for sample design. Initiate pilot study. Contact landowners; select, inventory, treat fuels, burn and monitor fuel consumption and below-ground temperatures to characterize the thermal environment on 2-4 units.

c. Planned for FY 88:

Analysis of FY 1987 data. Reassess current study plan and evaluate the need for supplemental laboratory research. Locate, inventory, burn, and monitor a minimum of 6-9 units which will include all units set up for the joint study on the Ecology and Management of Shrubs and Hardwoods in Coastal Forests.

6. Publication and Technology Transfer Activities:

a. Completed to date in FY 87:

None

b. Planned for remainder of FY 87:

Regional and forest level training sessions

c. Planned for FY 88:

Proceedings paper; Regional and forest level training sessions.

7. Estimated Cost:

	PNW
FY 87	40,000
FY 88	50,000
FY 89	50,000
FY 90	50,000
FY 91	50,000
FY 92	50,000

8. Duration of the Study:

Initiation date: FY 87
Scheduled completion date: FY 93

Fundamental COPE
Work Plan

1. Title:

Reducing Air Pollution From Hardwood Conversion Burning in Coastal Oregon.

2. Principal Investigator(s) and Organization(s):

Dr. David Sandberg, Project Leader, Pacific Northwest Research Station, Seattle
Dr. Roger Ottmar, Research Forester, Pacific Northwest Research Station, Seattle
Dr. Darold Ward, Research Forester, Pacific Northwest Research Station, Seattle
Dr. Colin Hardy, Research Forester, Pacific Northwest Research Station, Seattle

3. Study Objective(s):

Explore techniques of slash burning that reduce air pollutant emissions, and develop methods that verify the reduction.

a. Reduce emissions by burning uncured fuels.
b. Reduce emissions through mass ignition.
c. Measures the difference between coniferous and hardwood smoke.
d. Develop inventory techniques for coastal hardwood fuelbeds.

4. Potential Benefit or Utility of the Study:

The productivity of many stands in coastal Oregon is best maintained through the careful application of fire. New burning techniques may increase productivity of the timber resource, better protect the soil, water, and wildlife habitat quality, and improve air quality, without additional cost.

Forest Managers in coastal Oregon may be able to reduce smoke production by over 10,000 tons/year without reducing the area treated by fire if emission reduction techniques prove successful. Coastal burning programs are limited primarily by emission limits improved to protect visual air quality in Wilderness and to prevent significant deterioration of air quality in rural areas.

5. Research Activities:

a. Accomplishments to date in FY 87:

Preliminary data analysis of FY 86 field study results confirm that burning uncured fuels can reduce emissions by more than one-half. Analysis of FY 86 field study data on mass fire is inconclusive. The emission factors for criteria pollutants from hardwoods is similar to conifer-slash smoke. A series of ground-level photographs have been produced to improve pre-burn fuel inventories in coastal Oregon.

b. Tasks yet to be completed in FY 87:

Complete field study (now 85% complete) and analysis of uncured slash burning. Complete field study (now 50% complete) of mass ignition. Examine the apparent differences in smoke chemistry that distinguished hardwood smoke from other sources. Prepare a series of post-burn inventory photos, and attempt a remote-sensing inventory of coastal fuels.

c. Planned for FY 88:

Develop a mathematical model for curing rate of hardwood slash. Study attempts to burn in wetter spring conditions than possible with hand-ignition. Analyze the chemistry of the products of incomplete combustion (aldephydes and high molecular weight hydrocarbons). Field test a fuel inventory wing analytical stereo aerial photography.

6. Publication and Technology Transfer Activities:

a. Completed to date in FY 87:

Five technical papers, covering progress toward all four objectives, have been presented at the Northwest Forest Fire Council and the Air Pollution Control Association annual meetings. (all are in press) Results have also been covered in three regional training workshops; and in special sessions with the Siuslaw National Forest, Oregon Department of Forestry, and Oregon Forest Industry Council.

b. Planned for remainder of FY 87:

None

c. Planned for FY 88:

Publication of results in research papers and additional proceedings.

7. Estimated Cost:

	PNW
FY 86	56,000
FY 87	30,000
FY 88	35,000

8. Duration of the Study:

Initiation date:	FY 86
Scheduled completion date:	FY 88

COPE Study Prospectus

1. Title: Wildlife Habitat and Wildlife Diversity in Riparian Zones: A Gradient Approach

2. Principal Investigators and Organizations:

William McComb	OSU, Department of Forest Science/ Department of Fisheries and Wildlife
Robert G. Anthony	Cooperative Wildlife Research Unit/OSU, Department of Fisheries and Wildlife
David S. deCalesta	OSU, Department of Forest Science/ Department of Fisheries and Wildlife
E. Charles Meslow	Cooperative Wildlife Research Unit/OSU, Department of Fisheries and Wildlife

3. Applicable COPE Problem: Managing Riparian Zones

4. Study Objectives:

   a. Quantify food and cover, vertically and horizontally, along gradients parallel and perpendicular to streams in a representative set of watersheds in the north, central and south Coast Range.

   b. Determine the relative abundance of common vertebrate species and quantify patterns of vertebrate community structure and diversity along gradients within each watershed.

   c. Document numerical responses of common vertebrate species and vertebrate community diversity to vegetation manipulation.

   d. Develop and test hypotheses regarding the response of species and communities to changes in vegetation structure and composition.

   e. Assess habitat requirements and the zone of riparian influence for selected species that may be sensitive to riparian zone disturbance.

   f. Extensively sample habitat and vertebrate communities at sites throughout the Coast Range that represent a continuum of habitat conditions.

   g. Evaluate opportunities to manipulate vegetation for the maximum benefit of production of timber and of habitat for wildlife.

5. Justification:

There is currently almost no information which permits objective evaluation of tradeoffs for wildlife management in riparian zones. Controversies over the current Forest Practices Rules makes the need for this information a high priority. The goal of this research is to provide this needed information. Riparian zones receive water, nutrients and energy from upstream sources along the stream gradient, so they are potentially very productive ecosystems. They could add significantly to the food base of a watershed, thereby affecting vertebrate community structure. Variability in food and cover ought to be maximized through time along three spatial gradients: parallel to the stream (increasing floodplain size), perpendicular to the stream (moisture gradient), and vertically from the forest floor to the canopy. Characteristics of the stream and adjacent forest will influence these gradients. Research will be directed to provide information to develop prescriptions at a basin level in coordination with fisheries and forest ecologists working on other COPE projects.

6. Anticipated Initiation and Completion Dates: Initiation -- FY 1988
Completion -- FY 1997

7. Proposed Tasks to be Completed by Fiscal Year:

------------------------- 1st Year - FY 1988 -------------------------

A. Prepare formal problem analysis.

B. Evaluate potential research sites to determine what questions can be answered with what is available.

C. Develop a sampling system based on past riparian studies.

D. Prepare a detailed study plan.

E. Test sampling methods on some study sites.

------------------------- 2nd Year - FY 1989 -------------------------

A. Begin intensive sampling of riparian habitat, vertebrate communities and sensitive species.

B. Coordinate plans for experimental manipulations with forest and fish ecologists.

C. Begin to extensively sample riparian habitat, communities and sensitive species.

------------------ 3rd - 6th Year - FY 1990 - 1993 ------------------

A. Continue with intensive and extensive sampling.

B. Analyze pretreatment data and develop hypotheses regarding responses of communities and selected species to vegetation manipulations.

------------------ 7th - 10th Year - FY 1994 - 1997 ------------------

A. Implement vegetation management and monitor habitat and vertebrate community responses. Test hypotheses.

B. Assess temporal and spatial patterns of species abundance and vertebrate communities based on extensive sampling.

C. Begin to extrapolate and validate results outside of the intensively studied watersheds.

8. Publication and Technology Transfer Plans by Fiscal Year:

Results will be presented as they become available at workshops and short courses and/or incorporated into extension notes and newsletters. Formal publications will be prepared for peer-review journals.

9. Estimated Cost by Fiscal Year:

FY - 1988	$ 65,000.
FY - 1989	100,000.
FY - 1990	120,000.
FY - 1991	120,000
FY - 1992	120,000.
FY - 1993	100,000.
FY - 1994	100,000
FY - 1995	60,000
FY - 1996	60,000
FY - 1997	60,000

COPE Study Proposal

STUDY TITLE: A diagnostic tool for predicting the effects of interspecific competition on growth and yield of Douglas-fir.

PRINCIPAL INVESTIGATORS: Steven R. Radosevich, Michael Newton
Professors, Forest Science
Oregon State University
Corvallis, Oregon 97331

APPLICABLE COPE PROBLEM: Reforestation of coastal forests.

PROJECT OBJECTIVE: Develop an individual tree model capable of predicting the stem diameter, height and stem volume growth of young (3- to 25-year-old) Douglas-fir stands as a function of site factors, tree characteristics and level of interspecific competition.

JUSTIFICATION: Numerous mathematical models have been developed that predict the growth and yield of various tree species. These models have been constructed generally at three levels of resolution: whole stand, size-classes within stands, and the individual tree. The stand growth and yield simulator in most common use in the Pacific Northwest, DFSIM (Curtis et al. 1981), is used extensively to estimate the long-term yield potential of managed Douglas-fir stands. Given the site index and a set of stand-treatment specifications, DFSIM generates yield tables that predict probable stand development over time. However, a major limitation of DFSIM and other growth and yield models is their inability to be applied to stands less than 25 years old. Thus, existing growth and yield models do not include the effect of early interspecific competition or vegetation management treatments which are applied during this stage of stand development. It is believed that such treatments can have a substantial influence on future stand development (Burkhart and Sprinte 1984).

Unwanted hardwood, shrub, and herbaceous vegetation often invades, and sometimes dominates, newly-established forest stands following harvest (Newton and Knight 1981). Interspecific competition from such vegetation is known to limit the survival and growth of coniferous seedlings. Removal of such competition in young stands usually causes substantial increases in tree growth (Stewart 1984). Despite a large number of empirical studies on the response of Douglas-fir to competitor presence and removal, threshold levels of interspecific competition have not been well defined for young plantations. In addition, restrictions on the predominant tools used for vegetation management, such as prescribed fire and herbicide application, have increased in recent years. Such restrictions increase the cost of reforestation and require that foresters demonstrate the benefits of vegetation management activities. It is important, therefore, that foresters identify which sites and site conditions will respond best to vegetation manipulation. Threshold levels of interspecific competition controlling tree survival and growth also must be identified prior to the introduction of vegetation removal treatments. In addition, biological benefits of vegetation management must be weighed against costs of treatment and other economic considerations. Thus, a substantial demand has arisen to consolidate and synthesize existing research information into a comprehensive form that will allow prediction of the effects of competing vegetation over a wide array of forest sites and site conditions.

Since research cannot be conducted on every set of site conditions, we postulate that existing data can be systematically organized according to important site characteristics and vegetation parameters to provide a framework for diagnostic-management models of young Douglas-fir stands. Recent efforts in young loblolly pine stands indicate that such empirically derived models of young conifer responses to competition are possible and potentially of great management utility. Approximately 40 studies in the Oregon State University Forest Science data bank have been identified which can be used as an initial data base for the construction of such predictive models for young Douglas-fir stands. Furthermore, several members of the CRAFTS Forest Vegetation Management Cooperative have indicated a willingness to provide additional data (formerly of confidential status) for this effort.

EXPECTED ACCOMPLISHMENTS:

1. A series of individual-tree models which predict the stem diameter, height and stem volume of young 3- to 25-year-old Douglas-fir as a function of:

   (a) species, stature, or proximity of major vegetative associates,
   (b) duration of competitor presence,
   (c) tree characteristics or condition (animal damage, tree size, vigor at planting, etc.)
   (d) site (slope, aspect, elevation, soil type, etc.), and management (burning, scarification, etc.) factors.

2. Stand growth equations built from individual tree models that can be used to interface young stand growth to existing older stand growth simulators, such as DFSIM.

EXPECTED INITIATION AND COMPLETION DATES:

Project initiation 10/1/87
Project completion 9/30/90

TASKS TO BE COMPLETED BY FISCAL YEAR

1988: Survey and organization of data
1989: Begin model construction for certain competitors. Activity probably will concentrate on associations of Douglas-fir with red alder, bigleaf maple, salmonberry and/or tanoak
1990: Integrate model components, form predictions, validation.

PUBLICATION AND TECHNOLOGY TRANSFER BY FISCAL YEAR.

1988	Present findings in shortcourse on vegegation management or silviculture.
1989	Publish initial models and provide foresters with a manual describing data and procedures necessary to perform stand predictions.
1990	Publish in scholarly journals.

BUDGET.

	1988	1989	1990
Research Associate	20,000	25,000	27,500
Faculty OPE	6,060	7,575	8,332
Supplies	500	-0-	-0-
Indirect costs	9,429	11,727	12,900
Total	35,989	44,302	48,732

COLLABORATIVE ARRANGEMENTS:

Members of CRAFTS (Coordinated Research on Alternative Forestry Treatments and Systems), a vegetation management cooperative at Oregon State University, have agreed to provide a portion of funds necessary to complete this project. In addition, individual members of the Cooperative will provide previously confidential information for the generation of this model. Model-building efforts also will interface with the University of Washington Cooperative on young stand management.

COPE
Study Prospectus

1. Title: Environment and the Natural Regeneration of Conifers

2. Principal Investigator and Organization:
   Don Minore, Research Forester, Pacific Northwest Research Station, Corvallis

3. Applicable COPE Problem:
   Reforestation: Where and under what conditions might natural regeneration of conifers be substituted for current practices?

4. Study Objectives:
   - (a)Identify sites and vegetation types in coastal Oregon where planting is not needed to obtain successful conifer regeneration within five years of harvesting when adequate seed sources are present.
   - (b)Identify sites and vegetation types in coastal Oregon where planting is needed to obtain successful conifer regeneration within five years of harvesting regardless of seed source.
   - (c)Define and describe adequate seed sources for obtaining successful natural regeneration in suitable environments.
   - (d)Define and describe the riparian environments that are most suitable for natural forest regeneration.

5. Justification:
   Better guidelines are needed so that costly or controversial reforestation practices are used only where they are critically needed. Planting is a costly practice. High planting costs and the need to preserve locally adapted genotypes make it important to identify coastal environments in which conifers will regenerate naturally. Large initial investments in planting occur at the beginning of a rotation, and they are not recovered for many years. Where natural regeneration occurs promptly and dependable, however, those large initial investments are unnecessary. Furthermore, natural seleaction has been matching local tree and site characteristics for centuries in the old-growth forest stands now being harvested. Most plantations are less well matched to the sites on which they grow than those old-growth stands.

   Unfortunately, natural regeneration usually has been ignored as planting has become standard practice in coastal Oregon. Natural seedlings outnumber planted seedlings in many plantations, but new plantations continue to be established on similar sites with little regard for the need to plant or the characterization of plantation environments in terms of natural regeneration. This is wasteful. Planting is unnecessary in some coastal environments if an adequate seed source is present, and those favorable environments should be identified and described. Planting is essential if prompt regeneration is to be obtained in other environments, however, and those unfavorable environments also should be identified. This is particularly important in many riparian environments, where rapid reforestation with minimal soil disturbance may be important.

Natural regeneration is impossible without adequate seed sources, but quantitative descriptions of those seed sources are lacking. Parent tree size, number, distribution, and distance needed for successful natural regeneration in coastal Oregon should be measured and described. These measurements and descriptions should be related to the environments in which they occur if they are to be applied in identifying the sites and vegetation types where planting is unnecessary.

6. Anticipated Initiation and Completion Dates:

Initiation	May, 1988
Completion	September, 1990

7. Proposed Tasks to be Completed by Fiscal Year:

Measurement of environment, vegetation, seed sources, and natural regeneration	Fiscal years 1988, 1989
Data processing	Fiscal years 1989, 1990

8. Publication and Technology Transfer Plans By Fiscal Year:

Informal contacts in the field	Fiscal years 1988, 1989
Formal oral presentation (meeting)	Fiscal year 1990
Journal article	Fiscal year 1990

9. Estimated Cost

Fiscal year 1988	$25,000
Fiscal year 1989	$42,000
Fiscal year 1990	$25,000

F

ADAPTIVE COPE
Work Plan, FY 1988

I. Adaptive Research

A. Assemble a compendium of ongoing research and administrative studies in Coast Range forests by universities, agencies and industry.

B. Establish 3-5 new adaptive research studies at various locations in the Oregon Coast Range. Specific projects selected will depend on funds available, arrival dates of new scientists and ongoing work by others.

C. Prepare a long-range study plan for adaptive research by subject area (riparian zone management and reforestation).

II. Technology Transfer

A. Establish close working relationships with coastal resource managers through a series of office and field visits.

B. Make coastal citizens aware of the new program through the media.

C. Publish at least three issues of the COPE quarterly newsletter.

D. Conduct at least three state-of-the-art workshops on riparian zone management and reforestation topics at north, central and south coast locations; to describe research planned; to involve local managers and citizens in fine-tuning research objectives, selection of study sites, sharing existing data sets and experience, and contribution of "in-kind" support.

ADAPTIVE COPE
Budget Summary
FY 1988

Expenditures	FY 88 (requested)
Personnel (salaries, wages, and OPE)	202,700
Services and Supplies	10,603
Travel	45,000
Indirect Costs (overhead)	91,697
Capital Costs (equipment)	0
	350,000

Revenues	
Bureau of Land Management	70,000
USDA Forest Service, National Forests	70,000
Forest Industry	105,000
State Forestry	35,000
Counties	35,000
Other	35,000
	350,000